UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,313	02/25/2002	Sundara Murugan	P4524	5495

24739 7590 12/28/2007

CENTRAL COAST PATENT AGENCY, INC
3 HANGAR WAY SUITE D
WATSONVILLE, CA 95076

EXAMINER	
TSEGAYE, SABA	
ART UNIT	**PAPER NUMBER**
2619	
MAIL DATE	**DELIVERY MODE**
12/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/083,313	MURUGAN, SUNDARA	
	Examiner	Art Unit	
	Saba Tsegaye	2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed 09/27/07. Claims 1-35 are pending. Currently no claims are in condition for allowance.

Claim Objections

2. Claim 1 is objected to because of the following informalities: line 9, the phrase "the APS software-dependent data" lacks antecedence basis. Line 11, the phrase "said software" lacks antecedence basis. Appropriate correction is required.

Claim Rejections - 35 USC § 101

3. Claims 1-11 are rejected under 35 U.S.C. 101 because the claimed invention is directed to nonstatutory subject matter. The "APS software suite" as claimed and disclosed (e.g. page 2, lines23-25; page 5, line 6+, etc.) is nothing but software therefore these claims are nonstatutory.

Claim Rejections - 35 USC § 103

4. Claims 1-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simons et al. (US 6,332,198) in view of Zadikian et al. (US 6,724,757).

Regarding claims 1 and 12, Simons discloses, in Figs 1, 5, 29, 33A, an automated-protection-switching software suite for distribution over multiple processors of a distributed processor router comprising:

an APS server module (14, 20, 28) running on a first one of the multiple processors (12) for managing communication and distributing configuration and state information (column 7, lines 25-41); and

APS client modules (18a-18n, 22a-22n) running on second ones of the multiple processors (16a-16n), the APS client modules for monitoring interface state information, reporting to the APS server application, and for negotiating with other APS client modules (column 7, lines 25-41);

characterized in that all of the APS software-dependent data resides locally in APS software of individual APS modules (software backup spread on a combination of both primary and backup line cards in order to use the backup processes to quickly begin performing as if it was a failed primary line card (column 42, lines 39-52); **data reflecting the network connections** established by each primary process may be **stored** within each of the backup processes or independently on backup line card 16n (column 42, lines 63-67) *this allows to quickly begin transmitting network data over previously established connections to avoid the loss of these connections and minimize service disruption* (column 43, lines 1-8)) and further characterized in the that APS interface relocation from a primary interface (16a-16b) to a backup interface (16n) is performed through direct communication between the APS client modules running on the processors supporting the involved interfaces (fig 33a; column 42, lines 39-63).

Further, Simons discloses that a level of hot state (**software backup**) backup is inversely proportional to the resynchronization time, that is, as the level of hot state backup increases, resynchronization time decreases (column 42, lines 4-11; column 1, lines 33-57). Furthermore, backup line *card 16n executes backup processes to provide software backup.* It is preferred that

line card 16n be at least partially operational and ready to use the backup processes to quickly begin performing as if it was a failed primary line card (column 42, lines 39-52).

However, Simons does not expressly disclose that an APS protocol performs a switchover within a 50-millisecond time window.

Zadikian teaches a router that supports the restoration of a majority of network failures within **less than 50** ms (column 10, lines 48-55).

It would have been obvious to one ordinary skill in the art at the time the invention was made to add a method that switchover within 50 ms time window, such as that suggested by Zadikian, in the method for supporting multiple redundancy of Simons in order to minimize synchronization time and to provide a fast restoration time.

Regarding claims 2, 3, 13, 27 and 28, Simons discloses the APS software suite wherein the distributed processor router is connected to and operating on a data-packet-network (column 12, lines 50-67).

Regarding claim 4, Simons discloses the APS software suite wherein the APS software suite is implemented to protect the integrity of a plurality of primary interfaces of the router by enabling backup of individual ones of the interfaces at any given time during router operation (column 39, line 43-column 40, line12; column 45, lines 56-61).

Regarding claims 5, 14 and 29, Simons discloses the APS software suite wherein the plurality of primary interfaces comprises an APS grouping of interfaces connected to a SONET network (column 45, line 56-column 46, line 29).

Regarding claims 6 and 20, Simons discloses the APS software suite wherein the configuration and state information generic to a primary interface for relocation is mirrored to the client supporting the backup interface for the purpose of initializing and activating the backup interface to function as the primary interface (column 27, lines 51-67).

Regarding claims 7 and 21, Simons discloses the APS software suite wherein the distributed processors communicate with each other through a network of fabric cards implemented within the router (column 48, lines 1-11; column 50, lines 62-67).

Regarding claims 8 and 22, Simons discloses the APS software suite wherein all communication exchanges between the distributed APS components follow a message sequence scheme wherein each request and response has a sequence number (column 11, lines 31-47).

Regarding claim 9, Simons discloses the APS software suite wherein interface relocation is initiated by an APS client module after detecting an event requiring relocation at the primary interface to be relocated (column 40, line 60-column 41, line38).

Regarding claims 10 and 23, Simons discloses the APS software suite wherein the APS grouping of interfaces is physically supported on one processor (processor 12; column 7, lines 25-41).

Regarding claim 11, Simons discloses the APS software suite wherein the APS grouping of interfaces is distributed to and physically supported by multiple processors (processors 12, 13; column 27, lines 51-67).

Regarding claim 15, Simons discloses the distributed processor router wherein the APS software suit includes a server application, a server-client application, and a client module (column 7, lines 26-41).

Regarding claim 16, Simons discloses the distributed processor router wherein the server application runs on a control card, and the server-client application as well as the client module runs on a line card (column 7, lines 26-57).

Regarding claim 17, Simons discloses the distributed processor router wherein indication of an event is an APS signal received through the target interface on the backup processor (column 35, line 58-column 36, line 27).

Regarding claim 18, Simons discloses the distributed processor router wherein the received APS signal indicates one of the failure or severe degradation of the target interface (column 35, lines 36-47; column 36, lines 28-49).

Regarding claim 19, Simons discloses the distributed processor router wherein the received APS signal indicates an administrative request for interface relocation (column 39, lines 10-60).

Regarding claim 24, Simons discloses a method for relocating a primary router interface to a designated backup router interface using an APS suite distributed over multiple processors of a distributed processor data router comprising steps of:

a) mirroring current configuration and state information of the primary router interface to the processor supporting the designated backup router interface (column 27, lines 51-67);

b) receiving indication of a requirement to initiate an APS switchover (column 35, line 58-column 36, line 49);

c) determining if the backup router interface is available (column 35, line 58-column 36, line 49); and

d) activating the designated backup interface using the mirrored configuration and state information (column 27, lines 51-67).

Further, Simons discloses that a level of hot state (software backup) backup is inversely proportional to the resynchronization time, that is, as the level of hot state backup increases, resynchronization time decreases (column 42, lines 4-11; column 1, lines 33-57). Furthermore, backup line card 16n executes backup processes to provide software backup. It is preferred that line card 16n be at least partially operational and ready to use the backup processes to quickly begin performing as if it was a failed primary line card (column 42, lines 39-52).

However, Simons does not expressly disclose that an APS protocol performs a switchover within a 50-millisecond time window.

Zadikian teaches a router that supports the restoration of a majority of network failures within **less than 50** ms (column 10, lines 48-55).

It would have been obvious to one ordinary skill in the art at the time the invention was made to add a method that switchover within 50 ms time window, such as that suggested by Zadikian, in the method for supporting multiple redundancy of Simons in order to minimize synchronization time and to provide a fast restoration time.

Regarding claim 25, Simons discloses the method comprising an additional step e) for reporting any changed route results to a task manager responsible for distributing updated route tables to processors (column 28, lines 1-67).

Regarding claim 26, Simons discloses the method comprising an additional step for updating a forwarding database according to a switchover made (column 28, lines 1-67).

Regarding claim 30, Simons discloses the method wherein in step b) the indication is received at the primary interface (column 35, line 58-column 36, line 27).

Regarding claim 31, Simons discloses the method wherein in step b) the indication is received at the backup interface (column 35, lines 36-47; column 36, lines 28-49).

Regarding claim 32, Simons discloses the method wherein in step b) the indication is of the form of an administrative request (column 39, lines 10-60).

Regarding claim 33, Simons discloses the method wherein in step c) determination of availability of the backup interface partly depends on a priority state of the interface requiring backup (column 15, line 66-column 16, line17).

Regarding claim 34, Simons discloses the method wherein in step c) the backup interface is physically located on a processor separate from that of the primary router interface (fig. 1, 16a-16n; fig. 35, 546e).

Regarding claim 35, Simons discloses the method wherein in step a) the configuration and state information is selected from a table of such sets of information stored on the processor hosting the backup router interface (column 27, line 51-column 28, 65).

Response to Arguments

5. Applicant's arguments filed 09/27/07 have been fully considered but they are not persuasive. Applicant argues (Remarks, pages 8-9) that *"software backup" of Simons is not APS software, as claimed. Further, there is absolutely no evidence in the art of Simons that APS software backup is implemented by direct communication between the involved software module (primary & backup).* Examiner respectfully disagrees. Simons describes that network devices often implement industry standard redundancy schemes, such as those defined **by APS standard**

(column 49, lines 19-26). Further, Simons clearly discloses 1:1 or 1+1 or 1:N redundancy schemes that support hot backup of software (column 1, line 46-column 2, line 31; column 45, lines 61-67). In general, the 1+1 or 1:1 redundancy designs provide the highest reliability that minimizes network downtime.

Still on page 9, Applicant argues that the present invention, as claimed, *"teaches and N:N redundancy scheme because APS switchover is solely accomplished through direct communication between the APS client modules running on the processors supporting the involved interfaces. Applicant points out the benefit of applicant's invention because in Simons' teaching if the designated backup fails also, the network would fail. In applicant's invention all devices serve as both primary and backup devices for each other at all times, which is unknown in the art at the time of filing applicant's invention."* Examiner respectfully disagrees with Applicant contention. As shown in figs. 31-33, that 16a-16n (all devices) can serve as both primary and backup devices (see column 43, lines 54-67). For instance, Figs. 32a-32c, the primary processes executing on one line card may be backed up by backup processes running on one or more other line cards. In addition, each primary process may be backed up by one or more backup processes executing on one or more of the other line card.

On page 10, Applicant, further, argues that *in Simons, information and communication needed to facilitate true APS is not stored locally in software of each individual APS module, as applicant's invention and the 50 millisecond time frames could not be accomplished as claimed.* Examiner respectfully disagrees. Simons clearly discloses that "the hotter" the backup element.. that is, the closer the backup mirrors the primary.. the faster a failed primary can be switched over. The "hottest" backup element is one that runs hardware and software simultaneously with a

primary element conducting all operations in parallel with the primary element (column 42, lines 4-11; column 1, lines 33-57). Further, Simons as pointed out above, discloses that that network devices often implement industry standard redundancy schemes, such as those defined **by APS standard** (column 49, lines 19-26).

It is respectfully submitted that the pending claims as they currently stand read in the applied references.

NOTE:

Although Applicant has amended claim 1 to read "distributed" instead of "for distribution", it is still clear that the claim is directed to a computer program that's distributed or sent and as such it is still nothing but a computer program. Therefore the 101 rejection is maintained.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saba Tsegaye whose telephone number is (571) 272-3091. The examiner can normally be reached on Monday-Friday (7:30-5:00), First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing Chan can be reached on (571) 272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Saba Tsegaye
Examiner
Art Unit 2619

ST
December 21, 2007

WING CHAN
SUPERVISORY PATENT EXAMINER